



**US Army Corps
of Engineers®**

Engineer Research and
Development Center

Coastal Structures Expertise

Description

ERDC's [Coastal and Hydraulics Laboratory](#) provides research and development and engineering investigations of coastal structures and emergency flood-fighting structures. The U.S. Army Corps of Engineers maintains a large infrastructure of more than 500 coastal structures throughout the nation. These structures provide the only barrier between the sea and many harbors, channels and inlets. Their design, structural performance, and functional performance are important to the economic health of the country and are therefore a vital national interest. However, this infrastructure in the United States is aging with many structures exceeding 100 years in age. Maintenance of existing inlets becomes more important each year as ship traffic and ship drafts increase. As the inlet-protecting jetties erode, dredging costs can increase at an alarming rate. In addition, maintenance of existing revetments and other shoreline structures is becoming more important with increasing coastal population. As a result, inspection, repair, and rehabilitation of existing structures represent a large part of coastal structure work.



**Waves breaking along rubble-mound breakwater,
Cape Verde Islands**

Capabilities

CHL's [Coastal Structures Group](#) provides engineering assessment and develops design guidance and analysis tools for breakwaters, jetties, revetments, seawalls, piers, sills, and groins, as well as floating structures. These structures are most commonly used as part of navigation-related projects, but may also be used for homeland defense, wave reduction, wave energy production, flood control, shore protection and sediment control. Nearshore military logistics are also part of the CHL's Coastal Structure Group's mission including nearshore rapidly installed structures, offshore rapid structures and throughput modeling.

Supporting Technology

Engineering analysis tools include physical models, computer design models, wave-structure interaction numerical models, and life cycle or risk analysis models.

Benefits

The cost of maintaining the existing coastal rubble-mound infrastructure is high and methods for reducing these costs are being developed and employed. One present focus on reducing the costs of coastal structures is by employing risk, life-cycle, and reliability analysis techniques in both planning and design studies in order to develop more efficient designs. These design methodologies are becoming more prevalent in order to focus on life-cycle efficiency as opposed to the historical perspective of "no damage" for the design storm.

Success Stories

Some of the results of this capability include the following:

- [USACE Repair, Evaluation, Maintenance, and Rehabilitation \(REMR\) Research Program](#). This program was initiated in 1984 and was brought to completion in 1998. Technology developed under this 14-year effort focused on seven problem areas: concrete and steel, geotechnical, hydraulic, electrical and mechanical, environmental, coastal, and operations management. The primary goal of this research effort was to develop affordable technology that would extend the service life of the Nation's aging infrastructure.
- [CORE-LOC®](#). Core-Loc is a new breakwater concrete armoring technology developed by the Coastal Structures Group, which is in wide use by the worldwide engineering community. Its primary use is for armoring large navigation structures, such as breakwaters and jetties.
- [Monitoring of Completed Navigation Projects Program](#) evaluates the performance of completed civil works navigation projects. Its objective is to obtain information for verifying or improving navigation project performance.

Point of Contact

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